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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,924	03/31/2004	Byeong-Jun Lee	AIP3.001AUS	5060

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EXAMINER

RODRIGUEZ, WILLIAM H

ART UNIT	PAPER NUMBER
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3746

DATE MAILED: 05/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/813,924

Applicant(s)

LEE ET AL.

Examiner

William H. Rodriguez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,14-17 and 19-25 is/are rejected.
- 7) ☒ Claim(s) 2,7-13,18,26 and 27 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (*see page 5 paragraph [0021]; and page 8 paragraph [0037] of the specification of instant application*). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 22 is objected to because of the following informalities:

Claim 22 recites "each of the nozzle" in line 1. This recitation should be replaced by --each one of the plurality of premixed fuel nozzles-- in order to clarify that the premixed fuel nozzles are the ones located on an imaginary circle surrounding the at least one non-premixed fuel nozzle. Appropriate correction is required.

Claim 22 recites "neighboring nozzles" in line 2. This recitation should be replaced by --neighboring premixed fuel nozzles-- in order to clarify that the premixed fuel nozzles are the ones referred as "the neighboring nozzle". Appropriate correction is required.

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Double Patenting

3. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

4. Claims 1 and 3-27 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1 and 4-28 of copending Application No. 11/058,124. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claim 2 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 3 of copending Application No. 11/058,124. Although the conflicting claims are not identical, they are not patentably distinct

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from each other because of the elements or method steps recited in claim 2 of the instant application are clearly anticipated by claim 3 of the copending application '124. Therefore, claim 3 of copending application '124 anticipates claim 2 of the instant application '924.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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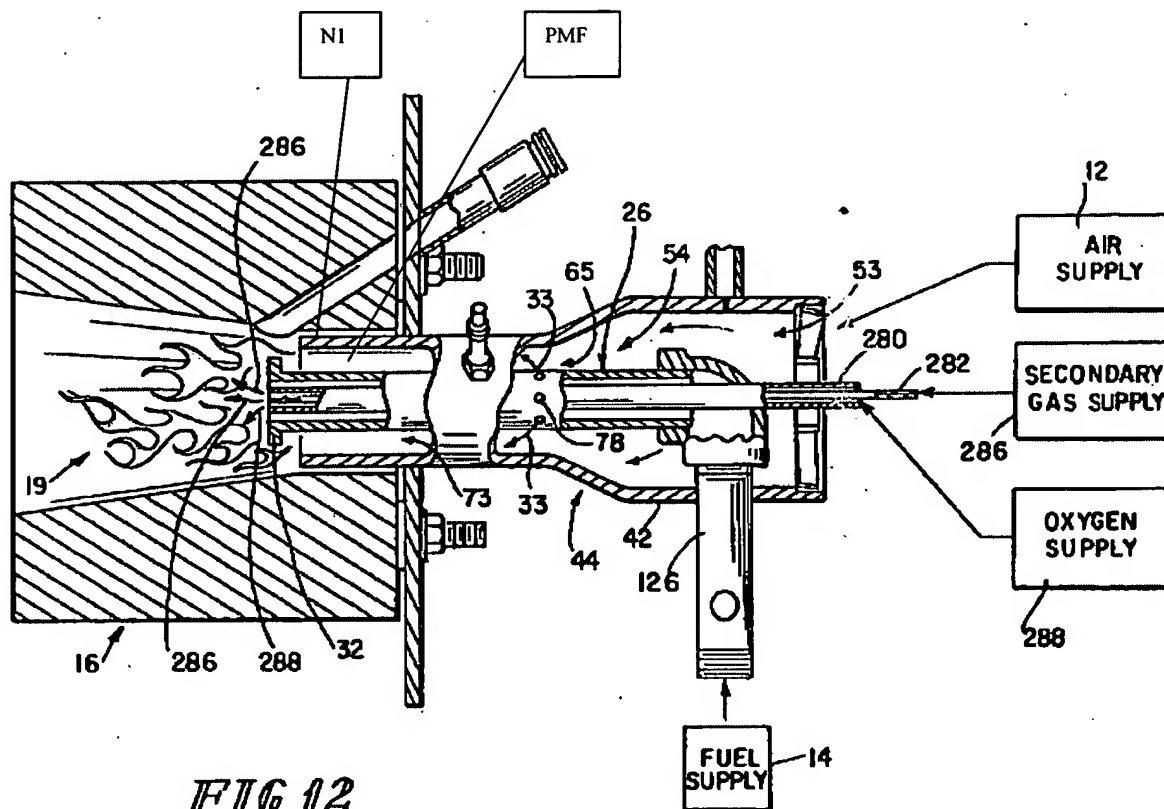
Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 3, 4, 5 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Cummings, III et al. (US 6,238,206).



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With respect to claim 1, **Cummings** teaches a method of combustion, comprising: supplying a premixed fuel PMF through at least one nozzle N1 into a combustion chamber, the premixed fuel comprising an oxidizer 12; supplying a non-premixed fuel 286 through at least one nozzle 282 into the combustion chamber; and simultaneously burning the premixed and non-premixed fuel in the combustion chamber. See particularly **Figure 12** of Cummings.

With respect to claim 3, **Cummings** teaches that the premixed fuel PMF is a mixture comprising an oxidizer 12 and at least one combustible material 14. See particularly **Figure 12** of Cummings.

With respect to claim 4, **Cummings** teaches that the non-premixed fuel comprises at least one combustible material 286. See particularly **Figure 12** of Cummings.

With respect to claim 5, **Cummings** teaches that the method further comprises supplying an oxidizer 288 substantially free of a combustible material through at least one nozzle 280 into the chamber. See particularly **Figure 12** of Cummings.

With respect to claim 15, **Cummings** teaches that the at least one nozzle N1 for the premixed fuel and the at least one nozzle 282 for the non-premixed fuel 286 are formed in a single piece fuel injector. See particularly **Figure 12** of Cummings.

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9. Claims 1, 3, 4, 6, 15 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwai et al. (US 6,070,411).

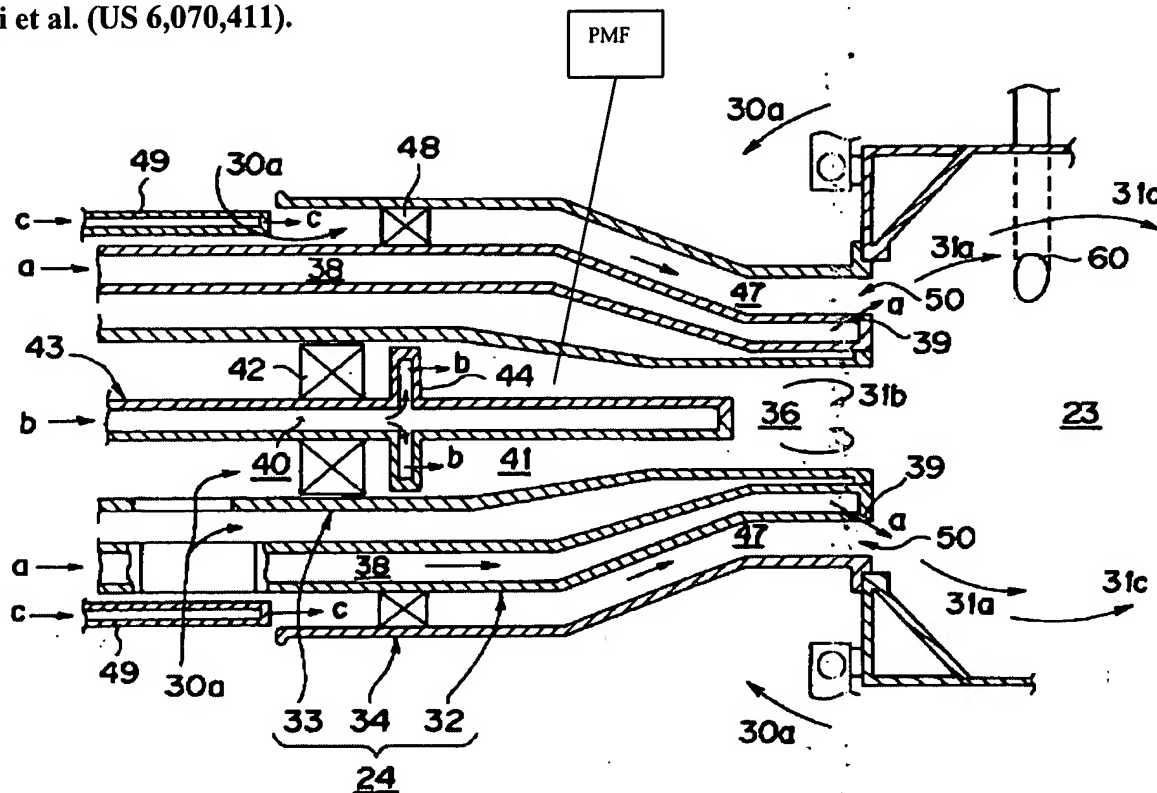


FIG. 2

With respect to claim 1, Iwai teaches a method of combustion, comprising: supplying a premixed fuel PMF through at least one nozzle 33 into a combustion chamber, the premixed fuel comprising an oxidizer; supplying a non-premixed fuel A through at least one nozzle 32 into the combustion chamber; and simultaneously burning the premixed and non-premixed fuel in the combustion chamber. See particularly Figure 2 of Iwai.

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With respect to claim 3, **Iwai** teaches that the premixed fuel PMF is a mixture comprising an oxidizer and at least one combustible material. See particularly column 9 lines 59; and **Figure 2** of **Iwai**.

With respect to claim 4, **Iwai** teaches that the non-premixed fuel A comprises at least one combustible material. See particularly column 9 line 45; and **Figure 2** of **Iwai**.

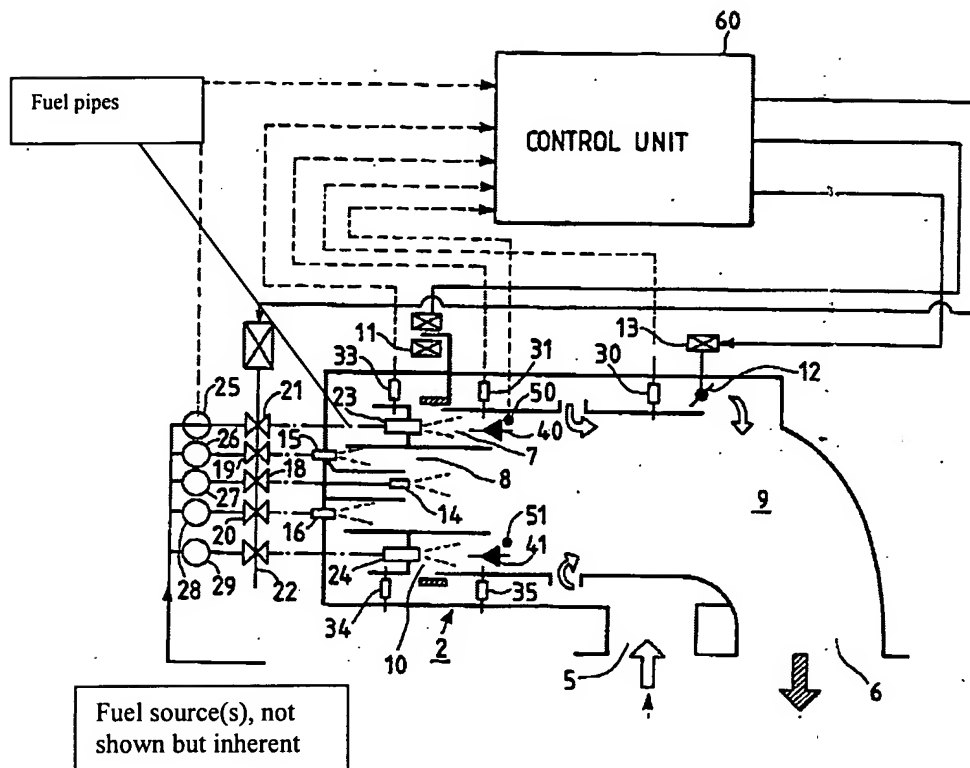
With respect to claim 6, **Iwai** teaches that the non-premixed fuel is supplied into the combustion chamber through a plurality of nozzle (only one shown but inherently there should be a plurality of non-premixed fuel nozzles 32 around the circumference of the combustion chamber). See particularly **Figure 1** of **Iwai**.

With respect to claim 15, **Iwai** teaches that the at least one nozzle 33 for the premixed fuel and the at least one nozzle 32 for the non-premixed fuel are formed in a single piece fuel injector 24. See particularly **Figure 2** of **Iwai**.

With respect to claim 16, **Iwai** teaches that the method further supplies the premixed fuel and non-premixed fuel using a plurality of the single piece fuel injectors 24 (Figure 1 only shows one single piece fuel injector 24, however, inherently there should be a plurality of single piece fuel injectors 24 around the circumference of the combustion chamber), each of which comprises the at least one premixed fuel nozzle 33 and the at least one non-premixed fuel nozzle 32. See particularly **Figures 1, 2** of **Iwai**.

10. Claims 17, 19, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by **Ohyama et al. (US 5,533,329)**.

FIG. 1



With respect to claim 17, **Ohyama** teaches a burner, comprising: a combustion chamber 2; at least one premixed fuel nozzle 23 configured to supply a premixed fuel into the chamber, at least one non-premixed fuel nozzle 14 configured to supply a non-premixed fuel into the chamber; at least one premixed fuel pipe (shown but not labeled) connecting the at least one premixed fuel nozzle 23 with a premixed fuel source (not shown but inherent); at least one non-premixed fuel pipe (shown but not labeled) connecting the at least one non-premixed fuel nozzle 14 with a non-premixed fuel source (not shown but inherent), and a controller 60 to control operation of the burner, wherein the controller is configured to operate the burner in one or more

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modes, in which the premixed fuel is supplied to the chamber through the at least one premixed fuel nozzle 23 and the non- premixed fuel is supplied to the chamber through the at least one non-premixed fuel nozzle 14. See particularly **Figure 1** of Ohyama.

With respect to claim 19, **Ohyama** teaches that the burner comprises a plurality of premixed fuel nozzles (23, 24), and wherein the plurality of premixed fuel nozzles are arranged so as to surround the at least one non-premixed fuel nozzle 14. See particularly **Figure 1** of Ohyama.

With respect to claim 20, **Ohyama** teaches that at least a portion of the plurality of premixed fuel nozzles (23, 24) is located on an imaginary circle (not shown but inherent since it is a typical arrangement used in the art) surrounding the at least one non-premixed fuel nozzle 14. See particularly **Figure 1** of Ohyama.

With respect to claim 21, **Ohyama** teaches that the at least one non-premixed fuel nozzle 14 is located on the center of the imaginary circle. See particularly **Figure 1** of Ohyama.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Iwai et al.** (US 6,070,411).

Iwai does not mention that a ratio of an amount of the non-premixed fuel to an amount of the premixed fuel is from about 0.001 to about 0.1. However, as well known as understood by a combustor designer (one of ordinary skill in the art), if a proper ratio between an amount of the non-premixed fuel (fuel only) to an amount of the premixed fuel (fuel and air) is not properly selected, when this mixture is burned (non-premixed + premixed) high levels of unwanted pollutants emissions will be produced due to the insufficient amount of air or oxygen in the mixture to completely oxidize the mixture. Therefore, it would have been obvious and within the level of one of ordinary skill in the art at the time the invention was made to have selected for **Iwai's** device a proper ratio of an amount of the non-premixed fuel to an amount of the premixed fuel within the range being claimed in order to prevent unwanted pollutant emissions to be produced.

13. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Ohyama et al.** (US 5,533,329) in view of **Prior Art Figure 2b**.

Ohyama does not schematically show that the nozzles are spaced apart from neighboring nozzles on the imaginary circle by substantially the same distance. However, **Prior Art Figure 2** shows a typical arrangement of nozzles, wherein the spaced apart distance between neighboring nozzles on the imaginary circle is substantially the same distance. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have placed **Ohyama's** nozzles at substantially the same spaced apart distance between

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neighboring nozzles in order to uniformly inject into the combustor the fuel flowing through these nozzles.

14. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ohyama et al.** (US 5,533,329).

With respect to claims 23 and 24, **Ohyama** teaches that each premixed fuel nozzle 23 has a substantially circular opening with a diameter configured to inject the premix fuel into the chamber. **Ohyama** does not mention that a ratio of the distance between neighboring nozzles to the diameter is from about 3-28 or 15-25. However, selecting a proper ratio of the distance between neighboring nozzles to the diameter from about 3-28 or 15-25 was within the level of a combustor designer (one of ordinary skill in the art). This ratio could have been selected based on the size of the engine, desired number of fuel nozzles, desired/required amount of fuel to be injected by each nozzle, and among other factors. Therefore, it would have been obvious and within the level of one of ordinary skill in the art at the time the invention was made to have selected an appropriate ratio of the distance between neighboring nozzles to the diameter within the claimed range for **Ohyama's** burner in order to provide a sufficient number of fuel nozzles as well as fuel nozzles of sufficient diameter to inject the necessary fuel for the engine to operate properly.

With respect to claim 25, **Ohyama** does not mention that a ratio of an amount of the non-premixed fuel to an amount of the premixed fuel is from about 0.001 to about 0.1. However, as well known as understood by a combustor designer (one of ordinary skill in the art), if a proper ratio between an amount of the non-premixed fuel (fuel only) to an amount of the premixed fuel (fuel and air) is not properly selected, when this mixture is burned (non-premixed + premixed)

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high levels of unwanted pollutants emissions will be produced due to the insufficient amount of air or oxygen in the mixture to completely oxidize the mixture. Therefore, it would have been obvious and within the level of one of ordinary skill in the art at the time the invention was made to have selected for **Ohyama's** burner a proper ratio of an amount of the non-premixed fuel to an amount of the premixed fuel within the range being claimed in order to prevent unwanted pollutant emissions to be produced.

Allowable Subject Matter

15. Claims 2, 7-13, 18, 26 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

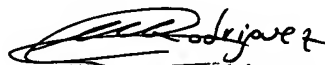
Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Rodriguez whose telephone number is 571-272-4831. The examiner can normally be reached on Monday-Friday 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S Thorpe can be reached on 571-272-4444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



William H. Rodriguez 5/17/05
Examiner
Art Unit 3746